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# Service evaluation of the paediatric thermal injury booklet in an emergency department in a tertiary centre

## C4ME SUPPLEMENT

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**YouTube Summary:**

<https://www.youtube.com/watch?v=y0ixtBQ7ktU>

**Background**

An estimated 25000 children present with burns and scalds annually in England and Wales. (1) Of all paediatric injuries, burns are associated with the longest hospital stay and extensive wound care and follow-up. (2) The significant burden of burns means that research in this area is essential.

Assessing burns is challenging. Total body surface area (TBSA) calculation and depth assessment guide referral decisions and fluid resuscitation. These assessments vary between clinicians and are generally inaccurate, particularly in children. (3, 4) Inflicted burns account for 8-20% of cases but asking questions about non-accidental injury (NAI) can be difficult. (1)

Accurate assessment guides decision making, from discharge home with red flag advice, to specialist referral and fluid resuscitation. Proformas have been associated with improved documentation in the ED. (5) The Paediatric Thermal Injury Booklet (Burns Booklet) was developed by a group of clinicians within a tertiary hospital and introduced to its ED in October 2014 to support comprehensive assessment and its documentation.

The aim of this project was to evaluate the Burns Booklet by comparing documentation of assessment before and after this intervention. If the booklet is successful, it may be escalated nationally.

## Methods

Children presenting to the ED with burns in February to April 2013 (n=50) and February to April 2019 (n=50) were included. As this study evaluates documentation rather than clinical details, exclusion criteria were not required, and convenience sampling was used. Patients from 2013 formed the non-proforma group. Patients from 2019, where the Burns Booklet was utilised, formed the proforma group. Ethical approval was not required. Access to the booklet is available from the references. (6)

Notes were assessed by a single reviewer for clear documentation of safeguarding considerations; history of injury; physical assessment and safety-netting advice. Domains were scored as 'documented' or 'undocumented'.

Pearson's chi-squared test was used to test statistical significance for each domain. Values were considered statistically significant if  $P \leq 0.05$ . All values are stated to 3 significant figures.

A meeting was also arranged with ED consultants, where results were shared. Suggestions for modifications to the booklet were discussed.

## Results

### *Safeguarding*

Documentation of the clinician checking the child's previous attendances increased by 82% ( $P < .0001$ ). Documentation of the child protection register (CPR) being checked increased by 62% ( $P < .0001$ ). Documentation of safeguarding considerations increased by 32% ( $P < .0001$ ).

### *History*

Documentation of presence of another person in the vicinity at the time of the burn increased by 74% after the booklet was introduced ( $P < .0001$ ). There was a 4% decrease in documentation of agent ( $P = .153$ ). There was also an 8% decrease in documentation of mechanism ( $P = .140$ ). These results were not statistically significant.

### *Physical Assessment*

Use of the Lund and Browder chart to calculate TBSA increased by 26% ( $P < .001$ ). There was a 4% decrease in documentation of anatomical site which was not statistically significant ( $P = .153$ ). Documentation of erythema and blisters increased by 40% ( $P < .0001$ ). There was also a 90% increase in documentation of a 'Wet, pink' appearance ( $P < .0001$ ) and an 88% increase in documentation of a 'Dry, White or Charred' appearance ( $P < .0001$ ).

### *Safety-netting*

Documentation of safety-netting increased by 74% ( $P < .0001$ ).

## Discussion

In the Burns Booklet, clinicians are prompted to check the CPR and ask about who was present at the time of injury, so more at-risk children can be identified.

The checklist-style layout of the booklet also supports good documentation of the assessment of the burn itself. For example, documenting "pertinent negative findings" is of particular importance in depth assessment. (7) Only 3.5% of paediatric burns are full thickness, therefore the associated features are seen less frequently. (1) In the non-proforma group, where notes are written out, the absence of such findings is rarely documented. As depth assessment varies between clinicians, this proforma may also improve consistency. (4)

The Lund and Browder chart reduces variability in TBSA calculation. (8) A 26% increase in its use is therefore likely to result in more appropriate referrals and fluid resuscitation.

Safety-netting is an essential component of safe discharge as patients presenting early may not yet have developed complications. (9) Provision of red flag advice will empower parents to monitor their child's health and reduce workload in the ED by promoting discharge.

Better documentation with the booklet also means that in the event of a complication and therefore scrutiny of the primary ED assessment, the clinician is better protected legally. (10)

Though not statistically significant, the booklet resulted in poorer outcomes in some domains. This may be addressed by training clinicians in using the proforma.

Thus, by standardising assessment of the burn as well as the patient's individual risk factors to inform management and discharge advice, the booklet shows clear success. We therefore recommend that it should be adapted for national use, with the end goal of standardised comprehensive assessment of children with burns across Wales.

## Lessons Learnt

### *Description*

This project initially involved learning about burns assessment, histopathology and how burns affect bodily systems. Gathering results involved evaluating patient notes, identifying presence of key documentation and using statistical tests to measure significance.

### *Feeling*

Wider reading was enjoyable as the learning could be applied clinically. At times, using the data was frustrating. I was focusing on documentation despite collecting extensive information on clinical findings. Using statistical analysis was satisfying as it reinforced the results.

### *Evaluation*

Producing a report with important results was a good experience overall. Although the limited word count meant that secondary outcomes could not be discussed in detail, they provided useful context.

### *Analysis*

In order to utilise the additional data, the project aim could have been amended, however, there are already many studies into the demographics of paediatric burns. The aim of this project was unique and directly impacts practice.

### *Conclusion*

The project was relevant and interesting, with a clear positive outcome for patients and staff.

### *Action*

In future, I will do a pilot of data collection to ensure the initial spreadsheet is appropriate and only relevant data is collected. I look forward to continuing with this project, ensuring an All-Wales Paediatric Thermal injury booklet is established.

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